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**The Design of Accountability Systems for  
Publicly-Sponsored International Coproduction  
Programs: A Need for Harmonization**

*Maureen H. Berry*

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FACULTY WORKING PAPER

College of Commerce and Business Administration

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THE DESIGN OF ACCOUNTABILITY SYSTEMS FOR  
PUBLICLY-SPONSORED INTERNATIONAL COPRODUCTION  
PROGRAMS: A NEED FOR HARMONIZATION

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Summary

Transnational civil and defense coproduction programs, sponsored by national governments, have been proliferating in recent years because of the opportunities they offer for economies of scale, the sharing of research and development costs, and technology transfer. Measuring the financial costs and benefits associated with each participant's efforts is complicated by the fact that disparate public contract pricing systems have to be accommodated within a single economic endeavor. This paper compares and contrasts public contract pricing in the United Kingdom, the United States, and West Germany, and suggests the need for the harmonization of international cost accounting practices.





## The Design of Accountability Systems for Publicly-Sponsored International Coproduction Programs: A Need for Harmonization?<sup>1</sup>

Transnational coproduction programs have increased in size and scope, especially in Europe during the last decade, and have had a significant impact on U.S. procurement and military equipment foreign sales policy. What has happened, essentially, is that structural change has occurred in traditional buyer-seller relationships, particularly in the European aerospace industry, in that nationally-sponsored firms in different countries are working together on civil and defense programs for which their governments may both assist the production financing and purchase the end product. This phenomenon has signalled the need to understand the problems of accommodating disparate public contracting systems within a single economic endeavor. More particularly, the problem of measuring the costs and benefits associated with the various coproducers' contributions, given that they operate under different public contract costing arrangements.

This study examines the main features of accounting for public contracts in the United Kingdom (U.K.) and West Germany, both major coproducers, makes some comparisons with the U.S. approach, and recommends the harmonizing of international cost accounting practices.

### The Evolution of Coproduction

Just ten years ago, sales of military equipment by the United States to foreign buyers totalled about \$952 million, thereby contributing over 90 percent of the value of Western air fleets.<sup>2</sup> In the past decade, however, U.S. domination of the civilian and defense aerospace industry has

been challenged by the steady growth in size and scope of international coproduction ventures. By using this term, we refer to investment and production projects carried out cooperatively by firms in two or more countries under the sponsorship of their respective governments, other than agreements involving production under license. International coproduction ventures can take on various forms: ranging from the joint pursuit of common goals through segregated activities, such as the Anglo-French Concorde program, to a "fundamental alignment of industrial activity".<sup>3</sup> This latter approach contemplates "joint financing, marketing and work-sharing arrangements and thus the creation of some form of transnational decision-making and administrative structure",<sup>4</sup> such as the Airbus program shared by France, Holland, Spain, the United Kingdom, and West Germany. Table I lists some of the major European civil coproduction programs.

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Table 1 goes about here  
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The European movement to coproduction has its roots in the North Atlantic Treaty Organization's (NATO) early reliance on collaborative efforts for defense projects. Such projects frequently originated in Memoranda of Understanding (MOUs) entered into on a government-to-government basis, each government nominating national firms which formed industrial consortia. Technologies became more sophisticated, research and development costs and production lead time increased, defense firms became more concentrated and more heavily Government-dependent, and defense markets more competitive. Transnational collaboration, with its

TABLE 1

SELECTED EUROPEAN CIVIL COPRODUCTION PROGRAMS

<u>PROGRAM</u>	<u>PARTICIPATING NATIONS</u>
1. <u>Civil Aircraft</u>	
A-300 Airbus airliner	France, Holland, Spain, United Kingdom and West Germany
Concorde Supersonic airliner	France, United Kingdom
Joint European Transport (JET)	France, United Kingdom, West Germany
Mercury twin-engined short-range airliner	Belgium, France, Italy, Spain, Switzerland
STOL airliner	Italy, USA
VFW-614 short-haul transport	Belgium, Holland, West Germany
2. <u>Space Projects</u>	
Sponsored by European Space Research Organization (ESRO):	
COS B Satellite	CESAR Consortium: Belgium, France, Italy, United Kingdom, West Germany
METEOSAR meteorological satellite	COSMOS Consortium: Belgium, France, Italy, United Kingdom, West Germany
GEOS satellite	STAR Consortium: France, Italy, Spain, Sweden, Switzerland, United Kingdom
Other:	
Symphonie telephone/television satellite (French & German government-sponsored)	CIFAS Consortium: France, West Germany
Orbital test satellite (OTS), European communications satellite (ECS), and MAROTS-B satellites	MESH Consortium: France, Holland, Italy, Sweden, Switzerland, United Kingdom, and West Germany.

SOURCE: Jane's All the World's Aircraft 1978-79, (New York: Franklin Watts, Inc., 1978)

obvious benefits of economies of scale, sharing of research and development costs, and technology transfer, therefore came to represent as much economic necessity as political strategy.

By the mid 1970s, the impact of these structural changes in the European aerospace industry reached across the Atlantic when the U.S. was drawn into collaborative efforts in the F-16 jet fighter program. Under an MOU signed in June 1975 by the United States, Belgium, the Netherlands, Denmark, and Norway, European contractors were awarded production and assembly contracts for the equivalent of 10 percent of the original 650 aircraft ordered by the U.S. Government, 40 percent of the aircraft ordered by European governments and 15 percent of any sales to third-countries.<sup>5</sup> The political reality that European production was indispensable for European procurement was soon recognized by the U.S. Congress when it passed "two-way street" legislation in 1976 identifying coproduction as the preferred method of increasing inter-Allied purchases.<sup>6</sup> By that time, the U.S. volume of military equipment sales to foreign buyers had reached \$8.7 billion, about half of this amount involving sales to NATO countries.<sup>7</sup>

The F-16 program involved more than 4,000 suppliers in the U.S. and Europe<sup>8</sup> and a number of factors contributed to delays in issuing contracts and subcontracts to the European Participating Government (EPG) firms:<sup>9</sup>

"Before these contracts could be awarded, a number of basic differences in EPG and U.S. contractual and business practices had to be resolved. These differences included patent rights, royalties, customs and duties, governing law, cost and pricing requirements, cost accounting standards, progress payments, termination, default, quality control standards, and contract audits. Negotiation of these issues contributed to a delay in awarded EPG subcontracts."

The institutional arrangements called for all aircraft to be built for the prime contractor, General Dynamics, which would in turn transfer them to the U.S. Government. The U.S. Government would then sell aircraft to the purchasing EPGs on a government-to-government basis.<sup>10</sup> Because of the contractual relationships established between the EPG firms and the U.S. Government prime contractor, the Cost Accounting Standards Board (CASB) undertook a review of various issues concerning the application of its standards, rules and regulations to foreign concerns. It concluded that:<sup>11</sup>

"...the cost accounting practices which foreign concerns follow vary substantially from country to country and contractor to contractor. The review also indicates that because of the requirements of individual countries, the application of some Standards may cause significant administrative problems".

As a result, the Board exempted foreign concerns and foreign governments from most of its requirements effective November 14, 1978.<sup>12</sup>

In the case of the Tornado program, on the other hand, the problem of international fiscal and public contracting differences was specifically provided for by Panavia Aircraft GmbH. This is an independent West German firm, formed in March 1969, which is in charge of the design, production, and sale of Tornado military aircraft coproduced by the United Kingdom (British Aerospace), West Germany (Messerschmidt-Boelkow-Blohm), and Italy (AerItalia).<sup>13</sup> This European industrial program, one of the largest yet attempted, has a special legal and contractual subcommittee to deal with the task of accommodating international differences in commercial practices.<sup>14</sup> The need for this type of organization was impressed on the U.K. as a result of its experiences with France in attempting to determine the development and production costs on the Concorde program.



Officials from both countries "found it impossible to make any meaningful comparison of development or production costs in the two countries, or even, if fact, to select an agreed basis of comparison from a number of possibilities".<sup>15</sup> Given the increase in the number of international civil and defense collaborative agreements, the U.K.'s Committee of Public Accounts felt that "it should be possible for collaborating Governments to identify the major areas in which cost-sharing problems will arise and to devise, in advance, mutually acceptable formulae for resolving those differences."<sup>16</sup> At the moment, however, the literature is very sparse concerning public contract costing practices in countries other than the United States. This field study of public contract accounting in the United Kingdom and West Germany, two major EPGs, was therefore undertaken in order to identify some of the dimensions of the problem.

#### Costing Public Contracts in the U.K., West Germany, and the U.S.

Generally speaking, the U.K., West Germany, and the U.S. follow the following format in preparing a cost proposal:

Direct materials  
Material overhead  
Direct engineering labor  
Engineering overhead  
Direct manufacturing labor  
Manufacturing overhead  
Other direct costs

= Factory cost

Design & development costs (IR&D)  
Selling & marketing costs  
General and administrative (G&A)  
Expenses

= Total cost input  
Profit  
Proposed contract  
price



### The regulatory framework and basic criteria for reimbursable costs

In all three countries, costs claimed under Government contracts have to meet certain basic criteria, such as: reasonableness of amount, allocability to Government work, and compliance with tax regulations and/or generally accepted accounting principles (GAAP). For example, distinctions have to be made between revenue and capital expenditures and costs have to be recognized in appropriate (benefitting) accounting periods. While there is general agreement as to what constitutes allocability and meeting GAAP, each nation has different views or tax regulations affecting the concept of reasonableness.

The U.S.,<sup>17</sup> takes the view that "a cost is reasonable if, in its nature or amount it does not exceed that which would be incurred by an ordinarily prudent person in the conduct of competitive business."<sup>18</sup> West Germany, on the other hand applies "the principle of efficiency" while the U.K. assesses reasonableness by defining what is unreasonable.

### West Germany

Two sets of basic contracting regulations exist in West Germany: the VOL (Verdingungsordnung fuer Leistungen), which deals with supplies, and the VOB (Verdingungsordnung fuer Bauleistungen), which deals with construction. These regulations apply to all public contracts issued at all levels of government. The Federal Ministry of Economic Affairs has jurisdiction over the regulations governing the pricing of public contracts while responsibility for the supervision of compliance with price control regulations lies with the State-level (Laender) Ministries of Economic Affairs.

The standard conditions for pricing public contracts are contained in the LSP (Leitsaetze fuer die Preisermittlung aufgrund von Selbstkosten).<sup>19</sup> Consonent with the West German free-market orientation, PR 30/53, Section 1, places heavy emphasis on the general principle that market prices are to be given preference over cost prices and that fixed prices are to be negotiated where the nature of the contract permits. The rules for determining cost prices are contained in the Schedule to PR No. 30/53 and these rules will be referenced parenthetically in order to minimize footnoting. The efficiency principle, mentioned earlier, is referred to in several places:

"In the determination of prices on the basis of cost as defined in these Rules, only those costs will be considered which, in their nature and amount, do not exceed those which, given efficient operation of the enterprise, would be incurred in the performance of the contract." [LL.4.(2)]

It is mentioned again in discussing: the quantities to be used in determining prices [II.7.(1)]; the allowability of wages, salaries and other labor costs (III.B.23); and the allowability of social costs-related additional benefits [III.B.25(2)(b)].

Discussions with several West German Government contractors as to how "efficient operation" is measured brought out the fact that because of price regulation surveillance, Government auditors have considerable comparative data at their disposal concerning operating costs of different firms at differing operating capacities. Intra-industry comparisons are facilitated by the individualized versions of standard charts of accounts which these firms use: generally versions of the GKR (Gemeinschafts-Kontenrahmen der Industrie) issued by the German Industry Association (BDI).

According to Section 10 of PR 30/53, the contracting public agency may perform audit reviews in order to determine whether a cost price conforms with the provisions of PR 30/53, provided that the Agency is generally authorized to do so or has been specially authorized, in a particular case, by the Federal Ministry of Economic Affairs. Section 10 also provides that the contractor may also request local audit participation. Further, the local pricing authority is empowered to establish a cost price should the contracting parties fail to agree. This sharing of audit authority, which is also related to the type of contract involved, is illustrated in Table II.

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Table II goes about here  
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#### The United Kingdom

The public contracting system in the U.K. is neither comprehensive nor so clearly defined as in West Germany. The rules and procedures governing the placing and administration of public contracts do not emanate from a single authoritative source but have developed within the various Government contracting departments in "case law" fashion. The chief mechanism for coordinating the contracting experience of these departments is the Committee of Public Accounts. Assisting in the process is the Treasury, long recognized for its expertise in contract work, which issues various procurement policy statements and rulings for consideration or compliance by Government buyers. The Public Accounts Committee reports and the Treasury Minutes on these Reports which include the opinions and actions of the Departments

TABLE II  
SHARING OF AUDIT AUTHORITY BETWEEN THE STATE-LEVEL  
MINISTRIES OF ECONOMIC AFFAIRS AND THE MAIN GOVERNMENT  
PURCHASING AGENCIES: FEDERAL REPUBLIC OF GERMANY

Type of Audit	State-level Ministry of Economic Affairs	Major Government Buying Agencies		
	Local State- level PUs <sup>1</sup>	Postal Administration	Railway Administration	Department of Defense
Market Price (Marktpreis)	X			
Fixed price (Festpreis)	X	X	X	X
Target Price (Richtpreis)	X	X	X	X
Cost-reimbursement (Erstattungspreis)	X	X	X	X

<sup>1</sup>Price Control Offices (Preisueberwachungs-stellen)

<sup>2</sup>Applicable to the aeronautical industry only

involved as well as the Treasury's position, constitute an authoritative body of contract principles and practice which all departments acknowledge.<sup>20</sup>

Although many different contract forms may be found in use, the two principal sets of standard conditions used in Government contracts are GC/Stores/1, for stores supplies other than "off-the-shelf" purchases, and GC/Wks/1 for building and civil engineering works. Both booklets contain standard conditions adopted by the principal Government purchasing departments. The pricing of noncompetitive stores contracts is discussed in Form GC/Stores/2.<sup>21</sup> This booklet contains a number of documents which do not constitute standard conditions but provide information for Government contractors, including: review of the profit formula; the Memorandum of Agreement reached between the Government and the Confederation of British Industry (CBI) in 1968, which established the Review Board for Government Contracts (the Review Board): and, in Appendix to Annexure 3, the Statement of Government Accounting Conventions. To minimize footnoting, these conventions will be referenced parenthetically.

The Review Board is an independent body whose five members are nominated by the CBI and the Treasury and whose chief function is to review and give rulings on referred Government profit formula risk contracts and subcontracts. It carries out a general review of industry's overall average earnings on Government contracts and sends a report of its findings and recommendations to the Treasury at three-year intervals.<sup>22</sup> A main channel of communication between the Review Board and Government contractors is the Joint Review Board Advisory Committee whose membership includes CBI representatives and certain interested trade associations.



In the UK, as in West Germany, Government reviews of contractors' accounting and estimating systems consider each firm on an individual basis. The Ministry of Defence (MOD) goes a step further than the West German Government, however, by requiring the completion of a questionnaire, similar in concept to the disclosure statement filed by U. S. defense contractors, describing the firm's cost allocation methods.

One of the Review Board's first tasks was to examine the existing Government Accounting Conventions used in pricing non-competitive Government contracts. These Conventions,<sup>23</sup> deal with two topics: the allowability and allocability of overhead costs attributable to Government work, and determination of profit through application of a formula based on capital employed for Government work.

Allowable overhead costs include those costs which are specifically identifiable to Government work as well as costs which are generally applicable to both Government and non-Government work. Excluded, on the other hand, are: those costs which are identifiable only to non-Government work; certain costs which are treated for tax purposes as capital expenditures and are otherwise not allowable for tax purposes; and those costs which are not regarded as occurring in the same periods as allowable for tax purposes (paragraph 1). The criterion of reasonableness is covered by item 11, paragraph 2A, of the Conventions which lists "unnecessary, extravagant or wasteful outlays" as items which would normally be totally excluded from overhead claims. All costs are presumed to be "reasonable" in amount, however, if Government contracts only constitute a small proportion of the contractor's sales volume.



Having examined the regulatory framework within which public contracting operates in the U.K. and West Germany, and the basic criteria which each country identifies in evaluating allowable costs, we proceed with a more detailed examination of the treatment of selected direct material and labor costs and indirect cost items.

### Material Costs

The special nature of much Government buying involves the acquisition of particular types of materials for particular contracts. Consequently, the use of invoiced costs, known as the "specific identification" method, is found in many historical-costing situations.

In West Germany, guidelines for the valuation of materials are contained in Part III(A) of the Schedule to PR 30/53. For forward pricing purposes, materials are to be valued at current prices [section 17(1)]. For historical costing, acquisition cost must be used if goods and services were purchased specifically for contract performance. If contract-required materials were drawn from inventory, prices current at the time of issue are to be used [Section 8.2(b)].

The "direct materials" classification may also include acquisitions from related companies. The transfer pricing provisions (III.A. 19) permit the use of market prices for commercial goods supplied by contractor-owned plants, less any customary discounts and adjusted for selling expenses saved. If non-commercial goods are involved, total cost is allowed if such transactions follow usual trade practice. Otherwise, cost price determined in accordance with PR 30/53 must be used. This is a less restrictive approach than that followed in the U.S., although the DAR [15-205.22(e)] does not mention selling expense adjustments. Any

external processing of contractor-furnished materials, or other farmed-out work, must be separately identified [III.A.12(2)] and may not be allocated any contractor-incurred manufacturing overhead [III.A.]2(3)].

### Labor Costs

The West German regulations concerning valuation of labor costs provide that for forward and historical costing purposes, the wages and salaries established by collective labor agreements are to be used, as well as the wages and salaries negotiated with individual employees where these are reasonable. In the case where the contractor is a partnership or sole proprietorship, imputed entrepreneurial remuneration may be included in costs as compensation in lieu of salary for services rendered by sole proprietors, partners, and their relatives. The same regulation also provides guidelines for "reasonable" imputed entrepreneurial remuneration, regardless of amounts actually withdrawn by the individuals in question (III.B.24). The U.S. also provides for imputed entrepreneurial wages as well as guidelines for determination of reasonableness which are very similar to the German approach [DAR15-205.6(a)2 and 3]. The U.K., on the other hand, expressly excludes notional (imputed) transactions [A(10)].

West German cost accounting conventions require that suddenly accruing costs of all types, not only personnel-related costs, be allocated to the several periods affected or benefited by them. This philosophy is echoed in the U.K. which also deals with problems of abnormal or lump-sum payments related to employees' compensation. If compensation is of an "abnormal nature" and is "substantial, yet admissible, some forward spread may be necessary" [2(B)3]. The U.K. deals with the

allowability problems of severance pay and pension provisions by allowing "reasonable redundancy payments in excess of the rates laid down by statute, made under the terms of a bona fide scheme." [2(D)3] This seems more generous than the U.S. provision:

"Costs of severance pay are allowable only to the extent that, in each case, it is required by (i) law, (ii) employer-employee agreement, (iii) established policy that constitutes, in effect, an implied agreement on the contractor's part, or (iv) circumstance of the particular employment." (DAR15-205.39)

The subject of deferred compensation is complicated, yet the U.K. regulations are brief because they largely rely on the income tax provisions: "lump sum additions to pension schemes: generally allowable on the Inland Revenue basis (but spread over a number of years if substantial)" [2(B)4]. The U.S. regulations devote considerable attention to the topic and generally require that to be allowable, both normal costs and past service costs must be claimed in the period to which they relate. [DAR15-205.6(f)2-S(a)]

### Indirect Expenses

Basic reasons for not permitting recovery of certain types of indirect expenses under Government contracts include: (1) that the Government does not benefit from the incurrence of a certain type of cost; and (2) that certain costs should be charged directly to the work which generates them rather than being classified as indirect expenses.

Table III summarizes the indirect expenses which are explicitly unallowable, wholly or partially, under cost-type contracts in the United Kingdom and West Germany. Because unwritten cost accounting

understanding are followed by Government suppliers and auditors in both countries, however, it is possible that other cost items, not mentioned in Table III, are also inadmissible.

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Table III goes about here  
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The international variability in accounting treatment of indirect costs is most marked in the following areas: advertising, contingencies, contributions and donations, entertainment, notional (imputed) costs, and sales discounts.

#### Advertising

West Germany does not allow advertising for marketable products nor like the U.K., does it permit "goodwill" related costs. Both nations subject any remaining types of advertising costs to the "reasonableness" test. The U.S., on the other hand, is less liberal in only permitting a very limited number of advertising expenses (DAR15.205.1)

#### Contingencies

West Germany does not permit recovery for contingencies if they are covered by insurance or if unrelated to business operations. In the U.K., contingency provisions have to be identified by exclusion from the basic cost estimate and submitted as a separate item for consideration by the Government buyer. They must be "adequately" defined and the proposal has to contain a "reasoned assessment of the probability of occurrence and its consequence for the cost of carrying out the work."<sup>24</sup> In the U.S., contingency provisions are generally unallowable for historical costing purposes since they are not normally present. For forward pricing purposes, the U.S. provisions are somewhat similar to the

TABLE III  
COSTS WHICH ARE WHOLLY OR PARTIALLY  
UNALLOWABLE UNDER GOVERNMENT CONTRACTS

<u>TYPES OF COSTS</u>	<u>REFERENCES</u>	
	<u>West Germany</u>	<u>U.K.</u> <sup>2</sup>
<u>Advertising</u>		
Of a "goodwill" nature	III.H.34	2(B)2
<u>After sales service</u>		
Attributable to a specific product		2(A)9
<u>Agents' commissions</u>		
Chargeable against civil sales		2(A)7
Not required in the preparation, making, or performance of the contract	III.I.35	
<u>Bad debts</u>	Not allowable by convention	2(A)4
<u>Certain Taxes</u>		
Including income taxes	III.F.30	
<u>Contingencies</u>		
Risks not related to the operations of the enterprise and/or covered by insurance	III.K.C.48(2)	
<u>Donations</u>		
Subscriptions and donations not allowable for tax purposes		2(A)1
Pooling levies or other arrangements of a similar nature		2(A)3
<u>Entertainment expenses</u>		
May be partially excludable if "unreasonable" in amount	III.H.34	2(B)1
<u>Fines and Penalties</u>		
Resulting from violations or, or failure to comply with law	Unallowable by Convention	

TABLE III (continued)

<u>TYPES OF COSTS</u>	<u>REFERENCES</u>	
	<u>West Germany</u>	<u>U.K.</u> <sup>2</sup>
<u>Insurance</u>		
Insurance of credit and goods in transit and any other related to civil work risks		2(A)6
Losses on other contracts	III.E.47(2) III.H.48(1)	
On losses of profits	III.E.48(1)	2(A)12
<u>Interest</u>		
Cost of raising and servicing capital	III.H.43(3)	2(A)2
Interest on borrowings, bond discounts, costs of financing and refinancing capital, and related costs	III.E.43(3)	
<u>Research and Development</u>		
Research and development and engineering costs designed to lead to new products for sale to the general public	III.D.27	
<u>Royalties, patents, license fees</u>		
Limited allowability as direct costs	III.G.33	2(A)13
<u>Sales discounts</u>		
Should be accounted for as adjustments of selling prices		2(A)5
<u>Shipping (Freight Out)</u>		
Treat as direct charges: most Government work shipped ex-factory	III.A.18(1)	2(A)8
<u>References</u>		

<sup>1</sup> Schedule to Regulation PR 30/53

<sup>2</sup> "Statement of Government Accounting Conventions Applicable from 1st August 1970 as Amended With Effect From 30th June 1971", Appendix to Annexure 3, Form GC/Stores/2, Edition October 1970 (published September 1972).



U.K.'s. If reasonably accurate estimates can be made of the effects of contingencies arising from "presently known and existing conditions" [DAR15-205.7(c)(i)] they may be included in cost estimates. Otherwise, they have to be separately disclosed and include the rationale on which they are based.

#### Contributions and Donations

Compulsory fees and contributions are allowable in West Germany to the extent that they are related to the contractor's operations. [III.F.32(1)] Donations to organizations are also allowable "if they are in the interest of the contractor's operations" [III.F.32(ii)], as well as "reasonable" other-than-statutory contributions. German firms state that their Government interprets these provisions very narrowly and in practice, reimbursable donations and contributions are severely limited. The U.K. is more liberal in that it only excludes contributions of a political nature. The U.S., therefore, stands alone in its total exclusion of contributions and donations. (DAR15.205.8)

#### Entertainment

The allowability of entertainment expenses follows the same pattern as contributions and donations. West Germany and the U.K. review entertainment expenses for reasonableness whereas they are completely excluded by the U.S. (DAR15.205.11)

#### Notional (Imputed) Costs

In the U.K., notional transactions would normally be totally excluded from contractors' claims for overheads and the conventions cite, as an example, an imputed rental charge for property owned. (2A10)

West Germany, in contrast, permits a number of types of imputed costs, including special depreciation charges (III.K.). In addition, unwritten cost accounting conventions provide that depreciation charges on fully-depreciated property which has been imputed to cost centers have to be treated as a credit in order to compensate for items of "individual risks". In the US, the DAR [15-205.9(g)] provides that no rental/use charge shall be allowed on property acquired at no cost from the Government or on fully-depreciated property but "a reasonable charge for the use of fully-depreciated property may be agreed upon and allowed" [15-205.9(i)].

#### Sales Discounts

Sales discounts are commonly classified in the U.K. as marketing costs and are grouped together with bad debts, credit and transit insurance, agents' commissions, after sales service costs, and freight out, in the Review Board's list of marketing costs which should be charged direct to the contracts which generated them.<sup>25</sup> West Germany and the U.S., on the other hand, account for sales discounts as deductions from revenues rather than cost elements.

#### Indirect expenses--prescribed accounting treatment

This analysis of indirect expenses concludes with a review of the required cost accounting treatment of depreciation, bid and proposal (B&P) costs, independent research and development (IR&D) costs, and marketing and selling expenses.

## Depreciation

Although international concern has been voiced about the effect of changing price levels on depreciation charges, only West Germany has thus far freed its contractors from the cost principle. Their regulations require that depreciation charges be determined by "evenly spreading the cost of acquisition or manufacture of an asset over its useful life," [III.D.(a)39(1)], which suggests that only the straight-line method can be used. The most important feature of the German depreciation provisions, however, is that the depreciation charge is to be determined "independently of the asset values stated in the balance sheet and in tax statements" [III.K.(a)38(1)] and "where the cost of acquisition or manufacture differs substantially from replacement cost, and this is not only a temporary development" [III.K.(a)38(2)] depreciation may be based on replacement cost "provided that the principle of valuation at replacement cost is consistently adhered to." [III.K.(a)38(2)] In view of the prevailing inflationary conditions these provisions provide German firms with the advantage of being able to claim higher depreciation charges which more closely measure the economic cost of the fixed asset services consumed.

In the U.K., depreciation charges are required to be consistent, reasonable, and related to the original cost of the asset. Any profit or loss on disposal is to be treated as an adjustment of the relevant depreciation charge [2(D)1] but no particular method is specified, other than calculation at the contractor's own rates [2(D)1]. The Review Board, however, has stated that some protection should be afforded contractors against inflation by permitting increased valuation of fixed

assets as both contract price and capital employed cost elements. The main stumbling block preventing the Review Board from recommending this for Government approval has been the lack of uniformity in accounting for changes in price levels. Consequently, the Board, while expressing the view that "the best measurement of true profitability would be the return on equity capital, after tax, on a inflation-adjusted basis,"<sup>26</sup> recommended that there should be "an interim review of the target rate if it should be necessary to continue with a historic cost based formula through to 1980,"<sup>27</sup> pending consensus of opinion concerning price-level adjusted accounting for fixed assets and related depreciation. Since this problem may have been resolved by the issuance of Statement of Standard Accounting Practice (SSAP) No 16: Current Cost Accounting, appropriate changes in the Review Board's position are to be expected in its next report.

The U.S. has also recognized the problem and, in October 1975, the CASB circulated a proposed Standard, (CAS 413), aimed at using price level adjustments for inflation in determining contract costs of depreciation. This proposed Standard was withdrawn in March 1976 when it was decided to combine the topic of adjusting historical depreciation costs for inflation with that of the imputed cost of capital employed.

#### Bid and proposal and IR&D costs

Bid and proposal costs are not separately identified in the West Germany regulations. Consequently, one has to look to cost accounting conventions agreed upon between a firm and its Government customer.

The topic of IR&D is discussed under the heading of "Independent" and "Contract-sponsored" Development (III.D.27) and in price calculations,

development and design costs have to be separately identified as one or the other. [III.D.28(2)] Examples of the types of costs included under these headings are development and design work, research, testing, and the manufacture of experimental items. If such work is "beyond the scope of the contractor's so-called "independent" development, it is subject to contractual agreement between the firm and the public agency and classifiable as "contract-sponsored" development. (III.D.27) All such costs incurred, and their allocation, have to be substantiated separately, the details being determined by agreement with the Government customer. [III.D.28(1)] For purposes of costing public contracts, product development costs are, by convention, excluded from overhead.

In the U.K., bid and proposal costs are usually classified as marketing and selling expenses and no separate accounting guidelines have been developed. The Government accounting conventions do not deal with the accounting treatment of IR&D costs but a full discussion of this topic is contained in the Review Board's survey of "conventions normally followed by Purchasing Departments".<sup>28</sup> IR&D costs are referred to as "private venture" research and development and all "reasonable" expenditures are generally accepted in overhead except for those incurred for exclusively commercial projects. Related product development costs are allowable overhead items for Government purchases of proprietary items "provided that the costs are reasonable for the industry and are allocated as overheads over all work of the contractor within the relevant product group."<sup>29</sup>

In the U.S., CAS 420, Accounting for Independent Research and Development Costs and Bid and Proposal Costs, requires that individual



IR&D and B&P projects be separately accounted for and treated as if they were final cost objectives.

#### Marketing and Selling Expenses

The most specific requirements regarding accounting for marketing and selling expenses are to be found in the U.K. which provide for their allocation within relevant product groups [2(B)6(c)], thus echoing its IR&D allocation provisions.

West Germany does not specify the accounting treatment of marketing and selling expenses in its regulations. Conventionally, however, after adjustment for unallowable items they are either allocated on a total cost input basis or as a percentage of total direct labor and manufacturing overhead.

The accounting treatment of marketing and selling expenses is not specified in the DAR either. In September 1978, the CASB circulated for comment a Staff Issues Paper: "Allocation of Selling and Marketing Costs" which presented some major conceptual issues. By 1979, this research project had not yet reached the completion stage.

#### Cost of Capital

This review of indirect expenses concludes with imputed cost of capital which is allowable for cost-reimbursement purposes in West Germany and the U.S. In the U.K., the amount of capital employed by the contractor forms part of the profit formula as described in the next section.

In West Germany, the two basic elements of the cost of capital calculation are operating capital and imputed interest on operating capital. In calculating the operating capital, the objective is to determine the



amount of those fixed and current assets which are used in the firm's main operations, thus excluding, in particular, idle facilities: except any standby equipment necessary for manufacturing or trading firms. The resulting "operating assets" amount is then reduced by "any interest-free advance payments and deposits received from the contracting public agency and any credits granted free of interest by suppliers under the agreed terms of payment," [III.K.(b)44(1)], thus arriving at "operating capital". Using average volumes during the accounting period, the operating assets are valued as follows [III.K.(b)45]:

Fixed assets

Residual values according to the provisions governing depreciation, i.e, acquisition cost or replacement cost less accumulated depreciation.

Current assets

Acquisition cost or cost of manufacture. If there is a substantial difference between these historic costs and replacement cost, the following substitutions may be made: current prices instead of acquisition cost and the cost of manufacture of an equivalent asset instead of the actual cost of manufacture of the asset. After adoption, valuation principles have to be uniformly and consistently applied.

Foreign currency securities and accounts

Exchange rates current at the reference date for which the operating assets are determined. Unusable or depreciated materials, semi-finished goods, or finished goods are to be deducted from current assets or included at reasonable residual values and the remainder of the current assets are to be included at their current values at the reference date. Unless otherwise provided for, any provisions for reductions in asset values are to be deducted from the gross book value of the assets.

The maximum allowable imputed interest rate, currently 6.5 percent, is established by the Federal Ministry of Economic Affairs in agreement with the Federal Ministry of Finance. This rate, applied to the computed operating capital, produces a preliminary cost of capital, such as interest

or rent. [III.K.(b)43(4)] The adjusted, and final, imputed interest chargeable to any particular contract is based on the proportion of contract cost to total production costs as the following simplified example demonstrates:

Average operating assets (values adjusted)		800,000 DM
Less:		
Interest-free advance payments	80,000 DM	
Interest-free credits	<u>40,000</u>	<u>120,000</u>
Average operating capital:		<u>680,000 DM</u>
<u>Imputed interest</u>		
Cost of capital, 680,000 DM, multiplied by		
currently allowable interest rate, say 6%		40,800 DM
Less interest on operating capital received		
during year:		<u>5,000</u>
Imputed cost of capital for year:		<u>35,800 DM</u>

The U.S. method of computing the cost of facilities capital is specified in Cost Accounting Standard (CAS) 414 and is similar to the German approach in that it multiplies a base figure (facilities capital) by a designated interest rate, established at semiannual intervals by the U.S. Secretary of the Treasury. The arithmetic mean of the specified interest rates is used for historical cost purposes, whereas the most recently published rate is used in connection with forward pricing.

The U.S. approach differs in several respects from the West German model (1) the assets included in the base are restricted to tangible capital assets and those intangible assets which are subject to amortization, thus excluding working capital, (2) net book values are used for valuation purposes; and (3) an imputed cost of money is calculated for each indirect cost pool which has a significant amount of allocated

facilities capital and which is used to allocate indirect costs to final cost objectives.

### Rewarding the Contractor

We turn now to the final consideration: that of rewarding the contractor. Each country uses a different approach to calculating profit, consonant with their differing philosophies as to the composition of the reward structure.

In the U.K., government departments have been using a common formula for a number of years, assessing profit in relation to capital employed in contract performance as established by a Treasury Committee in 1936.<sup>30</sup> The profit formula is "designed to give contractors a fair return on capital employed, equal on the average to the overall return earned by British manufacturing industry--the principle of comparability."<sup>31</sup> In West Germany, profit is viewed as "compensation for the general entrepreneurial risk" plus "an incentive fee to be granted if the contractor's economic, technical, or organizational performance has been outstanding." [III,L.51(a) and (b)] As in the U.K., calculation of the amount of profit involves consideration of operating assets. In the U.S., profit-setting has several objectives: to reward the contractor who undertakes more difficult work requiring higher skills; to allow the contractor an opportunity to earn profits commensurate with the extent of the cost risk he is willing to assume; to reward contractors who provide their own facilities or financing or who have established their competence through prior development work undertaken at their own risk; and to reward contractors for productivity increase. [DAR3-808.1(b)] A basic technique used for achieving these profit objectives is known as the

weighted guidelines method and includes the assigning of weighting factors to various elements of the contractor's cost proposal.

### West Germany

We commence with the West German model. It is interesting that although compensation for risk forms the conceptual basis for the contractor's reward, no distinction is made between the varying degrees of risk inherent in different types of contracts. Profit may be calculated in several ways: (1) as a percentage of the average necessary operating assets (Betriebsnotwendiges Kapital); (2) as a percentage of sales; (3) as the sum of two such percentages; or, (4) as a fixed amount, and the Federal Minister of Economic Affairs may establish guidelines or maxima. (III.L.52) In practice, the sum of two percentages is usually applied, the percentages being a matter of negotiation. One approach is to calculate asset turnover by dividing the firm's total costs (cost of sales plus all other costs) by average necessary operating assets. Next, assume that a rate of 3.5 percent on total costs is agreed upon, given a 1:1 asset turnover ratio, but subject to adjustment based on the firm's actual asset turnover ratio. Finally, assume a fixed rate of 1.5 percent on total costs is also negotiated. Under these assumptions, the following profit calculation would be made for a firm with a 2:1 asset turnover which submits a proposal for total costs of 100,000 DM:<sup>32</sup>

Total proposed costs		100,000 DM
Variable rate:		
Rate based on 1:1 ratio:	3.5%	
Adjusted for 2:1 ratio:	(3.5/2)	1.75%
Fixed rate:	<u>1.50</u>	3.25%
Profit amount: (100,000 DM multiplied by 3.25%)		<u>3,250</u>
Total contract award:		<u>103,250</u> DM

### The United Kingdom

In the U.K., the profit formula distinguishes between "risk" and "non-risk" work, so that separate calculations are required depending on the type of contract contemplated. It also includes a "return on capital" factor which in the U.S., and West Germany, as mentioned earlier, is considered a cost element.

The distinction between "risk" and "non-risk" non-competitive contracts is made as follows: "non-risk contracts are those on a cost-plus basis (whether with a percentage profit or a fixed profit element) which insulate the contractor against loss. All other contracts are classified as risk contracts; generally they are carried out on a fixed price basis, with the contractor bearing the full risk of higher costs than he anticipated and, correspondingly, receiving the full benefit of savings."<sup>33</sup> In calculating profit, no account is taken of the varying degrees of risk involved in different types of risk contracts.

The essential elements of the profit calculation are: the profit percentage rates, the amount of capital employed, and the cost of production. We proceed with an explanation of how these are arrived at and follow with a simplified example of their application.



Profit Rates in the U.K.

In July 1977, the Review Board in its second general review report made the following recommendations for profit rates, all of which were accepted by the Government:<sup>34</sup>

(a) Risk work

Fourteen percent on capital employed plus four percent on cost; on the basis of the CP/CE ratio of 2.25 to 1, this provides an average return on capital employed of twenty-three percent.

(b) Non-risk work

Eleven point five percent on capital employed plus (i) 0.5 percent on cost, and (ii) up to a further three percent on cost for efficiency (1.5 percent being the assumed average addition); on the basis of the CP/CE ratio of 2.25 to 1, this provides an average return on capital employed of sixteen percent.<sup>35</sup>

It was also recommended that the proportion of risk to non-risk work should be assumed to be 1.1:1.

Application of the profit formula has to be preceded by determination of the amount of capital employed and computation of the cost of production.

Amount of Capital Employed

Because of the difficulty of identifying the amount of capital employed with respect to particular contracts, capital employed is computed for the contractor's business as a whole unless separate data is available for Government work alone, as might be the case, for example, if Government work were confined to a discrete organizational unit. The method of calculating the amount of capital employed is detailed in Table IV. A simplified example of the calculation of capital employed follows.

- - - - -  
Table IV goes about here  
- - - - -

TABLE IV  
CALCULATION OF THE AMOUNT OF CAPITAL EMPLOYED  
THE UNITED KINGDOM

A.	Net investment (total assets minus current liabilities)	.....
B.	<u>Deductions</u>	
	1. Goodwill	
	2. Revaluation increments above historical cost in the balance sheet valuation of assets	
	3. Investments in shares and securities	
	4. Permanent loans to, or investments in the shares of, subsidiary companies	
	5. Underemployed fixed assets, including unoccupied land and buildings and idle plant and machinery	
	6. Cash or any other assets in excess of requirements	
	7. Any debit balance in the profit and loss accounts.	
	8. Deductions from gross work-in-process of any cash such as customers' deposits and launching aid	
	9. Patents and trademarks	.....
C.	<u>Additions</u>	
	1. Additions to work-in-process to restore any general reserves previously deducted by the contractor, except that reserves for specific anticipated losses are not restored, as well as any allocable overhead expenses	
	2. Tax reserve certificates for not more than an estimated two years' outstanding tax liability	
	3. Any items of semi-capital nature which should be amortized over several accounting periods but which the contractor charged off to expense	
	4. General reserves, but not specific reserves, deducted against debtors, (that is, allowances for bad debts)	
	5. Proposed dividends, but not dividends declared	
	6. Interest-bearing loans but not necessarily non-interest-bearing loans	
	7. Adjustment of taxation liability from balance sheet amount to amount due and payable at beginning of year under review	
	8. Amount equaling one-eighth of value of Government-owned assets loaned to the contractor under capital assistance agreements	.....
D.	Adjusted net investment	<u>.....</u>

TABLE IV (continued)

E. Average adjusted net investment (D plus adjusted net investment at end of prior fiscal year/2)	.....
F. Add interest at average rate on average bank overdraft	.....
G. Capital employed for year ended on balance sheet date	<u>.....</u>

SOURCE: Form GC/STORES/2, Edition, October 1970 (published September 1972), Appendix to Annexure 3, para. 4 (adapted).

GOVCON LIMITED  
Balance Sheets

	30 September 19X1 <u>£000</u>	30 September 19X0 <u>£000</u>
Net investment per balance sheet	5,307	4,068
Deductions:		
1. Fixed assets; re-valuation adjustment to restore to cost basis	150	150
2. Share and debenture issue expenses	6	3
3. Goodwill, patents and trademarks	90	110
4. Long-term investments	<u>500</u>	<u>500</u>
	<u>746</u> 4,561	<u>763</u> 3,305
Additions:		
1. General reserves--debtors	24	30
2. Proposed dividends	<u>320</u>	<u>120</u>
	<u>344</u>	<u>150</u>
Adjusted net investment	4,905	<u>3,455</u>
	<u>3,455</u>	
Adjusted amount for combined two years:	<u>8,360</u>	
Average adjusted net investment (divide by 2)	4,180	
Add interest at average rate of 10% per annum on average bank overdraft of £100,000	<u>1</u>	
Capital employed for year ended 30 September 19X1:	<u>4,181</u>	

Cost of production

The contractor's recorded production costs has to be adjusted to exclude any amendments necessary to comply with Government accounting conventions. A simplified version of this computation follows:

Year Ended  
30 September 19X1  
£000

Production costs per contractor's  
records

8,401.5

Adjustments:

Product advertising	30	
Bad debts expense	3	
Interest expense on borrowing	2.5	
Political donations	<u>4</u>	
		39.5
		<u>8,362.0</u>

The contractor's cost of production to capital employed (CP:CE) ratio is then calculated:

Adjusted cost of production:	<u>8,362</u>	
Capital employed:	<u>4,181</u>	= 2:1

We are now ready to apply the profit formula, assuming that Govcon Limited is negotiating a contract with an estimated cost of production of £100,000. Given that its CP:CE ratio is 2 to 1, the profit margin on the contract would be 11 percent (£11,000) for a risk contract or 7.75 percent (£7,750) for a non-risk contract.

#### Towards harmonization

Even though only major cost and profit elements are described in any detail, it is evident that differences in philosophy and practice exist between the EPGs and the U.S. when it comes to setting "fair" prices for publicly-needed goods and services. At the moment, specific cost-accounting/sharing agreements have to be provided for in each transnational collaborative venture and these programs are increasing in number and geographical dispersion.<sup>36</sup> A more efficient approach would be to establish some generally-accepted cost accounting practices for use in publicly-supported coproduction programs in order to provide a consistent measure



of the cost and benefits associated with each coproducer's efforts.

A recently published argument in favor of setting international cost accounting standards suggested the creation of an international management accounting institute to coordinate such activities.<sup>37</sup> A special public sector committee of such an international organization could provide the institutional framework for the search to harmonize public contract costing practices.

Footnotes

<sup>1</sup>Research assistance was provided by contributions from the Investors in Business Education, College of Commerce and Business Administration, University of Illinois, for which the author expresses her appreciation. The author thanks officials of the U.K. and West German Governments, as well as several West German aerospace firms, for their kind cooperation. She is also indebted to certain colleagues, notably Professors Peter Holzer and Hanns-Martin Schoenfeld, for their valuable assistance. This study combines two papers presented at the European Accounting Association's conventions held in Cologne, West Germany in March 1979 and in Amsterdam in March 1980.

<sup>2</sup>Bulletin of the European Communities, Vol. 5, No. 9, 1972, p. 22

<sup>3</sup>Hayward, Keith. "Politics and European Space Collaboration: the A300 Airbus", Journal of Common Market Studies, Vol. XIV, No. 4, p. 355

<sup>4</sup>Ibid.

<sup>5</sup>"European Partners Study F-16 Production Problems", Aviation Week & Space Technology, September 22, 1980, p. 22

<sup>6</sup>Department of Defense Appropriations for 1978. Hearings before a subcommittee of the Committee on Appropriations, House of Representatives, Ninety-Fifth Congress, First Session, Part 2 (Washington: US Government Printing Office, 1977), p. 98

<sup>7</sup>General Accounting Office, Foreign Military Sales--A Potential Drain on the U.S. Posture, LCD-76-455 (Washington: July 25, 1977)

<sup>8</sup>"First European F-16 Delivery Scheduled", Aviation Week & Space Technology, January 22, 1979, p. 42

<sup>9</sup>General Accounting Office, Sharing the Defense Burden: The Multinational F-16 Aircraft Program, PSAD-77-40, (Washington: August 15, 1977), p. 11

<sup>10</sup>Ibid., p. 7

<sup>11</sup>U.S., Federal Register, vol. 43, July 31, 1978, p. 33252

<sup>12</sup>U.S., Federal Register, vol. 43, November 14, 1978, p. 52693

<sup>13</sup>Jane's All the World's Aircraft 1978-79, (New York: Franklin Watts, Inc., 1978), p. 113

<sup>14</sup>Great Britain. Eighth Report from the Committee of Public Accounts, Session 1976-77, (London: Her Majesty's Stationary Office, 1977), p. 273

<sup>15</sup>Ibid, p. 267

<sup>16</sup>Ibid, p. xiv

<sup>17</sup>In the U.S., civilian agencies' procurement is controlled by the Federal Procurement Regulation (FPR) and defense procurement by the Defense Acquisition Regulation (DAR). Defense and nondefense negotiated contracts in excess of \$100,000 are subject to standards issued by the Cost Accounting Standards Board (CASB).

<sup>18</sup>Government Contract Reports. Defense Acquisition Regulation (Chicago: Commerce Clearing House, 1979), DAR 15-201.3

<sup>19</sup>From decree PR No. 30/53 of November 21, 1953: Bundesanzeiger No. 244 of December 18, 1953, amended by PR 8.61 of November 9, 1961, and PR 7/67 of December 12, 1967.

<sup>20</sup>Turpin, Colin. Government Contracts (Harmondsworth, Middlesex: Penguin Books Ltd., 1972), p.

<sup>21</sup>Form GC/STORES/2, October 1970 edition, published September 1972, Pricing of Government Non-Competitive Stores Contracts.

<sup>22</sup>Great Britain. Review Board for Government Contracts, Report on the First General Review of the Profit Formula for Non-Competitive Government Contracts, (London: Her Majesty's Stationary Office, 1974) p. 43

<sup>23</sup>Form GC/STORES/2, Appendix to Annexure 3

<sup>24</sup>Great Britain. Report on the Second General Review of the Profit Formula for Non-Competitive Government Contracts, (London: Her Majesty's Stationary Office, 1977), p. 51

<sup>25</sup>Great Britain. Report on the First General Review of the Profit Formula for Non-Competitive Government Contracts, (London: Her Majesty's Stationary Office, 1974), p. 5

<sup>26</sup>Great Britain. Report on the Second General Review of the Profit Formula for Non-Competitive Government Contracts, (London: Her Majesty's Stationary Office, 1977), p. 14

<sup>27</sup>Great Britain. Sixth Report from the Committee of Public Accounts, Session 1978-79, (London: Her Majesty's Stationary Office, 1979), p. xv

<sup>28</sup>Great Britain. Review Board for Government Contracts, Report on the Interim Review, (London: Her Majesty's Stationary Office, 1972), pp. 42-44 and p. 48.

<sup>29</sup>Ibid.

<sup>30</sup>Turpin, Colin. Government Contracts (Harmondsworth, Middlesex: Penguin Books, Ltd., 1972), p. 176

<sup>31</sup>Great Britain. Eighth Report from the Committee of Public Accounts, Session 1978-79, (London: Her Majesty's Stationary Office, 1979), p. xiii.

<sup>32</sup>Greifzu, Julius. Modern Accountancy (Das neuzeitliche Rechnungswesen) (Hamburg: Hammeich & Lesser, 1950), pp. 412-8. (adapted).

<sup>33</sup>Great Britain. Report on the First General Review of the Profit Formula for Non-Competitive Government Contracts, (London: Her Majesty's Stationary Office, 1974), p. 4

<sup>34</sup>Great Britain. Eighth Report from the Committee of Public Accounts, Session 1978-79, (London: Her Majesty's Stationary Office, 1979), p. xv.

<sup>35</sup>Great Britain. Report of the Second General Review of the Profit Formula for Non-Competitive Government Contracts, (London: Her Majesty's Stationary Office, 1977), p. 36.

<sup>36</sup>For example, two joint ventures: Anti-Ship Euromissile and Euromissile Dynamics Group were recently sponsored by the governments of France, the U.K., and West Germany (Wall Street Journal, January 3, 1980). These same countries are planning the joint development of a tactical fighter: the TKI-90 (Aviation Week & Space Technology, April 7, 1980). A newly formed Swedish Industry Group JAS is discussing the possibility of a joint development program with Israel, the U.K., the U.S., and West Germany. (Aviation Week & Space Technology, September 8, 1980).

<sup>37</sup>Enthoven, Adolph J. H., "International Management Accounting--A Challenge for Accountants", Management Accounting, September 1980, pp. 25-32.

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